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ABSTRACT

The present invention simplifies a codebook search in the vector quantization when coding an audio signal or the like, enhancing the vector search speed.

Each of the M basic vectors in a noise code book 260 is multiplied by a factor ± 1 in a sign adder 270 and combined in an adder 280 to create 2^M noise signed vectors. ^{The} ~~Here~~ the characteristic of the binary Gray code is utilized as follows. A change ΔG_u obtained between a noise signed vector based on a signed word i of the binary Gray code and a noise ^{sign} ~~signed~~ vector based on a sign word u adjacent to the sign ^{word} ~~word~~ i and different from the sign word i only in a predetermined bit position v is used in such a manner that a sign word u' which is next to reverse the bit position v on the Gray code sequence can express a change $\Delta G_{u'}$ from the noise signed vector by utilizing the fact that the sign word u' differs from the sign word u only in one bit position w excluding the bit position v . Thus, calculation is simplified, increasing the vector search speed.